

# The Physics of a golf swing

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Ever wondered about the science behind your golf swing? Or what the perfect swing 'sounds' like? Last week an expert in the physics of golf has visited the home of golf to talk about technology aimed at developing 'the perfect swing'.

Professor Bob Grober of Yale University, a Professor of Applied Physics and founder of Sonic Golf, took part in a special event at the University of St Andrews, UK. He delivered a public lecture describing the research which led to the invention of a novel new way of monitoring and analysing the golf swing and the biomechanics that lie behind it.

Using low power microelectronics, Professor Grober developed electronically enabled golf clubs using intelligent sensor systems. The technology provides quantitative measurements of the golf swing in unprecedented detail, by enabling real-time, audio feedback on the motion of the club. The development has radically changed the relationship between the golfer and the golf club, yielding new insights into many aspects of the swing, such as tempo and timing.

Professor Grober, himself a scratch golfer, said, "All great golf swings have great rhythm, tempo, and timing. These essential factors allow the best golfers to move in harmony with physics, unleash huge forces and generate soaring golf shots. But how do you know if you have proper rhythm? How do you improve tempo and timing? How do you know if you are building good habits or reinforcing bad ones?"

"The technology I have developed allows golfers to literally hear the

rhythm, tempo and timing of their swing, in real-time, and tune in to the most fundamental success factors of the golf swing."

The technology is based on cutting-edge science and modern learning theory and is designed for any level of golfer, no matter what their playing level or understanding of the mechanics of the golf swing is. It can be inserted inside the shaft of any club and the swing motion is transmitted wirelessly to a belt-worn headset that converts the swing motion to continuous musical tones.

Using the technology, golfers can hear whether a movement is jerky or smooth, and can even hear the release of the clubhead before it hits the ball. Slow swings are indicated by low pitch, quiet tones, while fast swings increase the pitch and volume of the tones. The idea is that golfers can improve each swing as a result of 'hearing' how good their last swing was.

Professor Grober continued, "The system is simple, straightforward, and amazingly effective - good golf swings sound good and bad golf swings don't! The aim of the technology is to help golfers make immediate and lasting improvements in their swing."

Professor Grober was invited to lecture at the University by St Andrews' physicist Professor Andrew Mackenzie, who met him during an academic visit to Yale last year that turned into the best golf lesson he has ever had.

Source: University of St Andrews

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